U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Platydesma remyi*

COMMON NAME: No common name

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: August 2005

STATUS/ACTION

___ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status

___ New candidate

__X_ Continuing candidate

___ Non-petitioned

_X__ Petitioned - Date petition received: May 11, 2004

_ 90-day positive - FR date:

_X_ 12-month warranted but precluded - FR date: May 11, 2005

_N_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions. During the past 12 months, most of our national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov).

___ Listing priority change

Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): 1997

___ Candidate removal: Former LP: __

___ A – Taxon is more abundant or widespread than previously believed or not subject to

the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Rutaceae (Rue family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Hawaii

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, island of Hawaii

LAND OWNERSHIP: Populations are on State and private lands.

LEAD REGION CONTACT: Paul Phifer, 503-872-2823, paul_phifer@fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, 808-792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION:

Species Description *Platydesma remyi* is a shrub or shrubby tree, 1 to 3 meters (m) (3.3 to 9.8 feet (ft)) tall with spreading branches that are leafy towards the ends. Vegetation is densely glandular punctuate throughout, while new growth and inflorescences are glabrous or have yellowish brown pubescence. Leaves are obovate with entire margins. The upper leaf surface is glabrous while the lower surface is sparsely pubescent when young. Flowers occur in axillary cymes composed of one to three flowers per inflorescence. Fruit is subglobose, 20 to 30 millimeters (0.08 to 0.12 inches) in diameter with five to eight seeds per cell. *Platydesma remyi* differs from *P. spathulata* primarily in having sessile or subsessile leaves and puberulent leaves, calyx and fruit (Wagner *et al*. 1999a).

Taxonomy *Platydesma remyi* was first described by Sherff as a species of *Claoxylon* and was later placed in the genus *Platydesma* by Degener *et al*. (1960). This species is recognized as a distinct taxon in Wagner *et al*. (1999a) and Wagner and Herbst (2003), the most recently accepted Hawaiian plant taxonomy.

Habitat The Kohala mountains population is scattered in wet, low statured forest above 914 m (3,000 ft), while the Hamakua population is found between 610 and 915 m (2,000 and 3,000 ft)

in wet forest (Hawaii Heritage Program 1992; Perlman and Wood 1996).

Historical and Current Range/Current Status This species is known from two populations (one each in the Kohala mountains and Hamakua) totaling less than 100 individuals (Hawaii Heritage Program 1992; Perlman and Wood 1996).

THREATS:
A. The present or threatened destruction, modification, or curtailment of its habitat or range. *Platydesma remyi* is highly and imminently threatened by feral ungulates that adversely modify habitat (Perlman and Wood 1996). Cattle (*Bos taurus*) from poorly fenced ranching operations intrude into the western border of the Kohala forest and the Hamakua area (Bryon Stephens, Hawaii Department Land and Natural Resources, pers. comm. 1996), and feral pigs (*Sus scrofa*) have severely degraded the forest understory in both the Kohala mountains and the Hamakua district. Pig damage to native forest is being monitored in a portion of the Kohala range of *Platydesma remyi*. The data show widespread and severe disturbance in most areas (B. Stephens, pers. comm. 1996). As early as 1778, European explorers introduced livestock, which became feral, increased in number and range, and caused significant changes to the natural environment of Hawaii. Past and present activities of introduced alien mammals are the primary factors in altering and degrading vegetation and habitats on the island of Hawaii. The pig is originally native to Europe, northern Africa, Asia Minor, and Asia. European pigs, introduced to Hawaii by Captain James Cook in 1778, became feral and invaded forested areas, especially wet and mesic forests and dry areas at high elevations. They are currently present on Hawaii and four other islands, and inhabit rain forests and grasslands. While rooting in the ground in search of the invertebrates and plant material they eat, feral pigs disturb and destroy vegetative cover, trample plants and seedlings, and threaten forest regeneration by damaging seeds and seedlings. They disturb soil and cause erosion, especially on slopes. Alien plant seeds are dispersed on their hooves and coats as well as through their digestive tracts, and the disturbed soil is fertilized by their feces, helping these plants to establish. Pigs are a major vector in the spread of many introduced plant species (Smith 1985; Medeiros *et al*. 1986; Scott *et al*. 1986; Tomich 1986; Stone 1985; Cuddihy and Stone 1990; Wagner *et al*. 1999a).

Cattle, the wild progenitor of which was native to Europe, northern Africa, and southwestern Asia, were introduced to the Hawaiian Islands in 1793. Large feral herds developed as a result of restrictions on killing cattle decreed by King Kamehameha I. While small cattle ranches were developed on Kauai, Oahu, and west Maui, very large ranches of tens of thousands of acres were created on East Maui and Hawaii. Much of the land used in these private enterprises was leased from the State or was privately owned and classified as Forest Reserve and/or Conservation District lands. Cattle eat native vegetation, trample roots and seedlings, cause erosion, create disturbed areas into which alien plants invade, and spread seeds of alien plants in their feces and on their bodies. The forest in areas grazed by cattle becomes degraded to grassland pasture, and plant cover is reduced for many years following removal of cattle from an area. Several alien grasses and legumes purposely introduced for cattle forage have become noxious weeds (Tomich 1986; Cuddihy and Stone 1990).

No known conservation measures have been implemented to date to address these threats.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
None known.

C. Disease or predation.
None known.

D. The inadequacy of existing regulatory mechanisms.
Pigs are managed in Hawaii as game animals but may populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Pig hunting is allowed on all islands either year-round or during certain months, depending on the area (Hawaii Department of Land and Natural Resources n.d.-a, n.d.-b, n.d.-c). However, public hunting does not adequately control the number of pigs to eliminate this threat to *Platydesma remyi.* Hunting of loose ranch cattle, the primary threat to this species, is no longer allowed in Hawaii (Hawaii Department of Land and Natural Resources 1985) except under permitted conditions. Cattle have been fenced out of one population of this taxon; however, without continued monitoring and maintenance of those fences, cattle from surrounding pasture areas can easily access fenced areas. No other known conservation measures have been implemented to date to address these threats.

E. Other natural or manmade factors affecting its continued existence.
This species is threatened by alien plant species (discussed below) that adversely modify habitat (Perlman and Wood 1996).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent were introduced from other parts of the world, and nearly 100 species have become pests (Smith 1985; Wagner *et al*. 1999a). Several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al*. 1998) indicate nonnative plant species may outcompete native plants similar to *Platydesma remyi*. Competition may be for space, light, water, or nutrients, or there may be a chemical inhibition of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al.* 1992; Ellshoff *et al.* 1995; Meyer and Florence 1996; Medeiros *et al.* 1997; Loope *et al*. 2004). In particular, alien pest plant species modify habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek *et al*. 1987). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to habitat of *Platydesma remyi*, the Service believes nonnative plant species are a threat to *Platydesma remyi*. The remaining unmanaged populations of *Platydesma remyi* are still impacted by this threat.

Particularly serious threats to *Platydesma remyi* are kahili ginger (*Hedychium gardnerianum*) in Kohala and banana poka (*Passiflora mollisima*) in both Kohala and Hamakua. Kahili ginger is capable of excluding all understory plants, even under an intact native canopy (Cuddihy and

Stone, 1990) and can supress seedling establishment even if ungulates are controlled. Banana poka infests over 518 square kilometers (200 square miles) on Hawaii and Kauai and severely alters forest structure (Cuddihy and Stone, 1990). These highly invasive species are uncontrolled and are measurably increasing in the wet forest habitats of *Platydesma remyi* (B. Stephens, pers. comm., 1996).

With only 100 or less widely scattered individuals in two populations, reduced reproductive vigor and extinction due to stochastic events, such as hurricanes or landslides, are also major threats. This species is represented in an *ex situ* collection at the Volcano Rare Plant Facility (U.S. Fish and Wildlife Service Controlled Propagation Database 2005).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The Hawaii Division of Forestry and Wildlife received funding from the Service in 2005 to eradicate cattle from the Hamakua area, but this project has not yet been implemented.

This species is represented in an *ex situ* collection at the Volcano Rare Plant Facility (U.S. Fish and Wildlife Service Controlled Propagation Database 2005).

SUMMARY OF THREATS

The major threats to this species include pigs, cattle, and nonnative plant species, which are believed to be a major cause of the decline of this species throughout its range. No conservation efforts have been initiated to date to address these threats.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

This species is highly threatened by feral pigs and cattle that degrade and destroy habitat, non-native plants that compete for light and nutrients, and reduced reproductive vigor and extinction due to stochastic events. Threats to the wet, low stature forest habitat of *Platydesma remyi* occur throughout its range and are expected to continue or increase without their control or eradication.

Imminence:
Threats to *Platydesma remyi* from feral pigs and cattle, non-native plants, and reduced reproductive vigor are considered imminent because they are ongoing.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *Platydesma remyi* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING:
The information in this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December of 1995, and was updated by personal communication with Ken Wood of the National Tropical Botanical Garden, Fredrick Warshauer of National Biological Service, and Bryon Stephens of Hawaii Division of Forestry and Wildlife. We have incorporated additional information on this species from our files and the most recent supplement to the *Manual of the Flowering Plants of Hawaii* (Wagner and Herbst 2003). In 2004 the Pacific Islands office contacted the following species experts: Bob Hobdy, retired from Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Natural Heritage Program; Arthur C. Medeiros III, U.S.G.S. Biological Resources Discipline; Hank Oppenheimer, resource manager for Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden. No new information was provided in 2004. In 2005 we contacted the species experts listed below, but received no new information on this taxon.

The Hawaii Natural Heritage Program identified this species as critically imperiled (Hawaii Natural Heritage Program Database 2004). Based on the International Union for Conservation of Nature and Natural Resources Red Plant Data Book rarity categories, this species is recognized as Rare (could be considered at risk) by Wagner *et al.* (1999b)

Species experts were contacted but did not provide new information this year, no new literature was found, and no known entities are studying this species. However, it is highly likely that the previously reported threats continue to impact the species at the same or an increased level.

COORDINATION WITH STATES

In October 2004 we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. Vickie Caraway, the State botanist, reviewed the information for this species and provided no additional information or corrections (V. Caraway, pers. comm. 2005).

LITERATURE CITED

List all experts contacted:

Name	Date	Place of Employment
1. Joel Lau	June 28, 2005	Hawaii Natural Heritage Program
2. Art Medeiros	June 28, 2005	U.S.G.S. Biological Resources Discipline
3. Jim Jacobi	June 28, 2005	U.S.G.S. Biological Resources Discipline
4. Rick Warshauer	June 28, 2005	U.S.G.S. Biological Resources Discipline
5. Hank Oppenheimer	June 28, 2005	Maui Land and Pineapple Company
6. Kapua Kawelo	June 28, 2005	U.S. Army
7. Dave Lorence	June 28, 2005	National Tropical Botanical Garden
8. Steve Perlman	June 28, 2005	National Tropical Botanical Garden
9. Ken Wood	June 28, 2005	National Tropical Botanical Garden
10. Marie Bruegmann	July 13, 2005	U.S. Fish and Wildlife Service
11. Vickie Caraway	June 14, 2005	Hawaii Division of Forestry and Wildlife

List all databases searched:

Name	Date
1. Hawaii Natural Heritage Program	2004
2. U.S. Fish and Wildlife Service Controlled Propagation Database	2005

Other resources utilized:

Center for Biological Diversity, Dr. Jane Goodall, Dr. E.O. Wilson, Dr. Paul Ehrlich, Dr. John Terborgh, Dr. Niles Eldridge, Dr. Thomas Eisner, Dr. Robert Hass, Barbara Kingsolver, Charles Bowden, Martin Sheen, the Xerces Society, and the Biodiversity Conservation Alliance. 2004. Hawaiian Plants: petitions to list as federally endangered species. May 4, 2004.

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Degener, O., I. Degener, E. Sherff, and B.C. Stone. 1960. *In:* Degener and Degener. Flora Hawaiiensis, fam. 179. *Platydesma remyi*.

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Hawaii, Department of Land and Natural Resources. N.d.-a. Summary of Title 13, Chapter 123, Game mammal hunting rules, island of Oahu. Division of Forestry and Wildlife, Honolulu. 2 pp.

Hawaii, Department of Land and Natural Resources. N.d.-b. Summary of Title 13, Chapter 123, Game mammal hunting rules, island of Molokai. Division of Forestry and Wildlife, Honolulu. 2 pp.

Hawaii, Department of Land and Natural Resources. N.d.-c. Summary of Title 13, Chapter 123, Game mammal hunting rules, island of Maui. Division of Forestry and Wildlife, Honolulu. 2 pp.

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Loope, L.L. and A.C. Medeiros. 1992. A new and invasive grass on Maui. Newsletter of the Hawaiian Botanical Society 31: 7-8.

Loope, L., F. Starr and K. Starr. 2004. Management and research for protecting endangered Hawaiian plant species from displacement by invasive plants on Maui, Hawaii. Weed Technology 18: 1472-1474.

Medeiros, A.C., L.L. Loope, P. Conant and S. McElvaney. 1997. Status, ecology, and management of the invasive plant, *Miconia calvescens* DC (Melastomataceae) in the Hawaiian Islands. Bishop Mus. Occas. Pap. 48: 23-36.

Medeiros, A.C., L.L. Loope, T. Flynn, S.J. Anderson, L.W. Cuddihy, and K.A. Wilson. 1992. Notes on the status of an invasive Australian tree fern (*Cyathea cooperi*) in Hawaiian rain forests. American Fern Journal 82: 27-33.

Medeiros, A.C., Jr., L.L. Loope, and R.A. Holt. 1986. Status of native flowering plant species on the south slope of Haleakala, East Maui, Hawaii. Coop. Natl. Park Resources Stud. Unit, Hawaii, Techn. Rept. 59:1-230.

Meyer, J.-Y. and J. Florence. 1996. Tahiti's native flora endangered by the invasion of *Miconia calvescens* D.C. (Melastomataceae). Journal of Biogeography 23: 775-781.

Perlman, S. and K. Wood. 1996. Kohala Mountains surveys. Prepared by the National Tropical Botanical Garden for U.S. Fish and Wildlife Service, Honolulu.

Robichaux, R., J. Canfield, F. R. Warshauer, L. Perry, M. Bruegmann, and G. Carr. 1998. Adaptive Radiation. Endangered Species Bulletin. November/December.

Scott, J.M., S. Mountainspring, F.L. Ramsey, and C.B. Kepler. 1986. Forest bird communities of the Hawaiian Islands: Their dynamics, ecology, and conservation. Studies in Avian Biology 9:1-429. Cooper Ornithological Society, Los Angeles.

Smathers, G.A. and D.E. Gardner. 1978. Stand analysis of an invading firetree (*Myrica faya* Aiton) population, Hawai`i. Proceeding of the Second Conference on Natural Science, Hawaii Volcanoes National Park, pp. 274-288.

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Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999a. Manual of the Flowering Plants of Hawai`i, Bishop Mus. Spec. Publ. 97:1-1918. University of Hawaii Press and Bishop Museum Press, Honolulu.

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Wagner, W.L. and D.R. Herbst. 2003. Electronic supplement to the manual of flowering plants of Hawai‘i, version 3.1. December 12, 2003. Available from the Internet. URL: http://rathbun.si.edu/botany/pacificislandbiodiversity/hawaiianflora/supplement.htm.

Wood, K.R. and S. Perlman. 1997. Maui 14 plant survey final report. Submitted by National Tropical Botanical Garden, October, 1997.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all 12-month petition findings, additions of species to the candidate list, removal of candidate species, and listing priority changes.

Approve: Acting _____ 11/16/05
Regional Director, Fish and Wildlife Service Date

_____

Concur: _____ August 23, 2006
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: September 20, 2005
Conducted by: Marie M. Bruegmann, Pacific Islands FWO
Plant Recovery Coordinator

Comments:
PIFWO Review

Reviewed by: Christa Russell Date: September 27, 2005
Plant Conservation Program Leader

Gina Shultz Date: October 14, 2005
Assistant Field Supervisor,
Endangered Species

Patrick Leonard Date: October 14, 2005
Field Supervisor